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13 AUG 1959

Notes on Revised Draft Project 32.2471

Insert A, Para. 3

States that there is no statement by a final authority. Is contradicted by last sentence of p. 2, which relies on "the more authoritative sources...."

Why not resolve this problem by saying:

Although the term is used in a dual sense in the USSR, the more authoritative sources define the types of production on the basis of volume of output.

Is sentence on middle of p. 2 still in? Where?

P. 5, Para. 2

Isn't C., Methods of Production, a further development of the organization of production? Why not drop para. 1 of p. 5 as outdated (1949) and continue para. 2 as part of B? Aren't the organization and the method the same thing?

P. 7, 1st full para.

You have a good point on tolerance, but ^{you} don't make it in the most effective manner. I think your point is that when machines are built on a one-of-a-kind basis, interchangeability of non-wearing parts may be unimportant and therefore the parts are custom fitted. Why not say: Since there is less need for interchangeability of parts, allowances and tolerances follow by rest of present sentence/. As a result much custom fitting is required in the final assembly of the product.

Pp. 8-9

Your example in Insert B helps account for not introducing a more efficient machine tool. But consider the billet cutter in the same terms. Since it takes only 105 minutes to cut each billet, the machine cuts 320 billets in only 16 minutes and presumably stands idle for 944 minutes each day. Is that why this process is called small series? It appears here that the equipment used in a subprocess is more efficient than that used in the combined operation; the subprocess is not continuous for the whole day and is thus in something less than mass production. By this token the billet cutter is too efficient and should not have been installed. This is not necessarily so, because its efficiency in the use of labor is being ignored. In any event the formula (i.e., mass production) a characteristic of inefficiency rather than efficiency and for this reason does not seem an appropriate measure. If one can say moreover, that a more efficient machine tool should not be installed, then one must ask why was equipment with excess capacity introduced to carry on processes 1 through 5?

mid 25
continuous
operation

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Notes (continued)

Is this formula widely used in the USSR or is it merely the theoretical proposal of a single engineer?

I see no value in presenting this formula in the paper when its chief use is to show that mass production is a continuous operation that requires two shifts to do a job which could be done in say one shift by more efficient equipment under large series conditions. It is not necessary to use this mathematical approach to show that subprocesses are not equally efficient. For the purpose of this paper it is subsidiary and can be treated descriptively.

Insert D

A good attempt to cope with the problem. Needs to be condensed and tightened to eliminate repetition. Is now wordy and halting. Sort out the points you wish to make and do so in a more straightforward manner. See text for suggested rearrangement of examples.

VII. Conclusion

Is concise and represents more ^{mature} ~~mature~~ thought than Insert D, but it is so negative as to leave little opportunity to apply it positively. I suggest rephrasing sufficiently to provide a qualified area for application of the concept to new equipment then use this conclusion as your model in tightening Insert D.

VIII. Seriality and the Production of the ICBM

Have another look at the suggestions in para. 3 of my original memo. The intention was not to give a firm estimate of ICBM production in this project but to develop with the aid of I/CM the appropriate characteristics of the ICBM for the purpose of categorizing it as a production item and then setting some limits. My thought was that a table could be drawn up showing the rough limits of small, medium and large scale production for a piece of large, complex equipment such as the ICBM, based on the discussion in your paper.

Monthly estimates of ICBM output are too tentative to be reproduced in this paper even though agreed to by the community. However, estimates of three levels of ICBM production schedules are available. What I had in mind was relating the alternatives in such a table to the ranges of production associated with the various levels of series production.

One other matter concerns me. There is little discussion of batch size in the body of your paper. If batch is important for application to the ICBM in connection with Table 1, it should be developed earlier in the paper. I am not convinced, however, that all of the data in Table 1 are open ended. At least some of the specific types of machinery shown in Table 1 appear to be sourced

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Notes (continued)

Table 1 should therefore be rechecked against Table 2. Note, for example, the break in the frequency distribution under Coal Mining Equipment in Table 1 between 100 and 200. Judging from Table 2, the Medium Series coal mining category should be 25-200 not 25-100. Is this correct? If so then the data in Table 2 indicate 25-200 per month, do they not? Cannot the rest of Table 1 be related to particular time periods rather than to batches without regard to time?

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